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THE ENTOMOLOGICAL SOCIETY OF LONDON

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TRANSACTIONS AND PROCEEDINGS OF THE SOCIETY.

Some of the early volumes of the Society's Transactions are out of print, but those which are in stock can be obtained at reduced prices. Any single volume of the present series, 1868–1887, is sold at 10*s*. to Fellows. The volumes for 1868–1890, in sets of not less than five, as well as the five of the Third Series (1862–1867), can be obtained by Fellows at greatly reduced prices on application to the Secretary. The following is a price list of recently published parts of the Transactions—

1926.—Transactions, Vol. LXXIV: Part I, £3 0*s*. 0*d*., to Fellows, £2 5*s*. 0*d*.; Part II, £3 10*s*. 0*d*., to Fellows £2 12*s*. 6*d*.

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1929.—Transactions, Vol. LXXVII: Part I, £1 10*d*. 0*d*., to Fellows, £1 2*s*. 6*d*.; Part II, £2 14*s*. 0*d*., to Fellows, £2 0*s*. 6*d*.

Proceedings, Vol. IV: Part I, 6*s*. 0*d*., to Fellows, 4*s*. 6*d*; Part II, 4*s*. 0*d*., to Fellows, 3*s*.0*d*.

The 1893 Catalogue of the Library, with Supplement to 1900, is published at 10*s*.; to Fellows, 7*s*. The Supplement only, 4*s*. 6*d*.; to Fellows 3*s*.

Wednesday, June 5th, 1929.

Dr. K. Jordan, President, in the Chair.

Obituary.

The deaths of Sir A. Buchan-Hepburn and of Mr. F. Cocks, Fellows of the Society, were announced.

Appointment of Registrar.

The President announced that Mr. F. J. Griffin had been appointed Registrar of the Society as from the 1st July, 1929, from which date the new Bye-Laws passed at the Special Meeting held on the 5th April, 1929, would take effect.

Election of Fellow.

The following was elected a Fellow of the Society:—Lt.-Col. The Viscount Hood, 61, Porchester Terrace, W.2.

Exhibits.

Trechus cardioderus not a British Species.—Mr. H. E. Andrewes said:—

"On June 4, 1924, I exhibited a specimen of *Trechus* alleged to have been captured some fifty years ago at Burghfield in Berkshire. It was one of a number of specimens sent to Dr. R. Jeannel, who was engaged on a Monograph of the Trechini, and who considered it at that time as new. For a long time I heard nothing more, but ultimately Dr. Jeannel returned the specimen with an intimation that he now considered it to be an example of *Trechus cardioderus*, Putz., a species of the Eastern Alps and Carpathians. Although at first it seemed to me improbable, I am now convinced that some accidental exchange of labels or insects must have occurred; this is rendered more probable by the fact that some thirty or forty years ago I collected a good deal in the Austrian Tyrol, and probably the insect in question was taken at that time. I think it is evident that a mistake has occurred, and I therefore desire to withdraw the suggestion of the discovery of a new British *Trechus* made five years ago."

Hornets and rare Beetles from Windsor Forest.—Mr. H. Donisthorpe exhibited:—

1. Some twigs of ash from Windsor Forest which had been "ringed" in various places by hornets gnawing the bark off, and asked if this was generally known and what the object might be. He also mentioned their habit of setting sentinels at the entrance to their nests, and said this appeared to be an approach to what Wheeler had called "phragmatism" in ants of the genus *Colobopsis*, which blocked up the entrances of the nest with their heads. A toad had a similar habit, and a spider is known which uses the posterior part of the body for the same purpose.

2. Two species of *Anaspis* new to science—*Anaspis florenceae*, Donis., described last year, and *Anaspis* sp., not yet described; both from Windsor Forest.

3. *Megapenthes lugens*, Redt., and *M. tibialis*, Lac., both very rare beetles,

also from Windsor Forest. The former as far as he knew having only been found singly at Highgate, Stockwell, Mickleham, and in the New Forest. The former was recorded from Windsor by Stephens in 1832.

A CURIOUS NEST BUILT BY A WASP OF THE GENUS *ODYNERUS* BETWEEN THE FRONT OF A BOOK AND THE BACK OF A BOOKCASE.—Prof. POULTON exhibited part of the nest of an *Odynerus* consisting of three nearly perfect cells, and the contents which had been extracted by Dr. Eltringham, D.Sc., from two damaged cells. This nest, which had been kindly sent by Miss Balfour, F.E.S., was constructed in the hollow space between the concave, gilt-edged front of a book and the flat back of a bookcase, at Fishers Hill House, Hook Heath Road, Woking, Surrey. Assuming that the book was vertically placed,* the nest itself was also vertical, as shown by the clear impression of the separate leaves upon its gilded surface; for the gilt adhered to the cells and was removed with them when they were detached. The flat opposite surface of the nest bore traces of a reddish paint evidently detached from the back of the bookcase. This paint showed under the lens a vertical striation doubtless caused by the grain of the wood. Speaking of the gilded surface of the nest as the front and the painted surface as the back, its two sides were constructed of mud which filled up the space, rather under $\frac{1}{8}$ in. deep, between the leaf-edges and the back of the bookcase. The book itself had also contributed, as shown by fragments of the gilding here and there embedded in the mud. The cells were walled off from each other by mud partitions. Other parts of the nest—viz. the convex front and the flat back, were quite free from mud and evidently lined by a powerfully adhesive cement laid on by the parent, and later by a cocoon spun by the larvae. This latter was partially detached from the inner surface, and it is therefore clear that the gilding and the paint had been removed by the cement. The perfect insects had emerged by gnawing holes in the mud sides. The width of the nest was slightly under $\frac{3}{8}$ in., its depth from back to front nearly $\frac{1}{8}$ in. at the sides, $\frac{3}{16}$ in. along the centre, the increase being due to the marked convexity of the front.

The fact that the nest-builder was an *Odynerus* was conclusively proved by the nature of the contents, viz. the heads of three caterpillars, also by caterpillar mandibles. There were also present two small Tachinid flies which had died and were extracted from the puparium; a part of a Dipterous puparium, evidently Tachinid; and of the pupal sheath of ? *Odynerus*; a fragment of the head of an insect, ? an ichneumon; and one mite.

A MALE *AGLAIS URTICAE*, L., PERSISTENTLY COURTING A MALE *BRENTHIS EUPHROSYNE*, L.—Prof. POULTON exhibited the two butterflies referred to in the following note by his friend Mr. O. H. Latter, F.E.S. :—

"24 *April*, 1929. *The Elms, Charterhouse Road, Godalming.*

"On 6 June of last year I saw a very dark butterfly, that I could not identify as it flew, eagerly pursuing and apparently wishing to mate with a *Brenthis euphrosyne.*

---

* Mrs. Henry Sidgwick, to whom the book belongs, has kindly examined the back of the bookcase and has found traces of the nest which prove that the position was nearly vertical; also that the book stood near and in part overlapped a groove in the casing which probably provided a means of exit for the offspring.

I ran in and got my net, and captured them both, expecting to find the dark one a melanic variety of *euphrosyne*; I have one such taken here years ago. To my astonishment I found it was a very tattered specimen of *Aglais urticae* ! "

The condition of the *urticae*, also perhaps its want of perception, were not to be wondered at, as it was certainly a 1927 specimen which had hibernated and lived for over five months in 1928.

BUTTERFLIES ATTACKED BY BIRDS.—The following specimens, both of which bore the evidence of seizure by a bird's beak, were exhibited by Commander J. J. WALKER, who described the circumstances as follows :—

(1) The two fore-wings of a *Pieris brassicae*, L., ♂, attacked (evidently at rest) by a hen sparrow, and devoured with great avidity, in the garden path of 74, Lonsdale Road, Summertown, Oxford, at 8.45 a.m., on 6 May, 1929. This attack was witnessed by myself from a first floor window, at a distance of some 25 feet, and lasted about a minute before the bird flew off undisturbed, having eaten the whole of the body of the butterfly.

(2) A female example of a very dark form of *Satyrus semele*, L., taken by myself in a grove of pine and oak above Funchal, Madeira (about 1200 feet elevation), 11 August, 1884. This specimen is in perfectly fresh condition, but has lost a large part of both hind-wings, evidently by the attack of a bird, as is shown by a well-defined " beak-mark " on the right fore-wing.

THE SPOTTED FLYCATCHER DEVOURING BUTTERFLIES AND WASPS.—Prof. POULTON said that on again consulting Mr. C. W. Colthrup's record (Witherby's *British Birds*, IX, p. 92, 1915–16), quoted in *Proc. Ent. Soc. Lond.*, IV, p. 41, 1929, he had been led to the following interesting observations.

J. H. Owen (*British Birds*, VIII, pp. 115, 116, 1914–15) stated that the food of the young Spotted Flycatcher consists of " flies, daddy-long-legs, bluebottles, many kinds of small moths, and butterflies up to the size of (and including) the common white butterfly, and wasps " [believed to be " the common wasp "], which were " brought to the young fairly frequently." " I noticed," the author continues, " that the parents were most particular to render all large insects inert before feeding them to the young, and particularly so with wasps. In about a quarter of an hour one morning I saw five wasp-pellets * ejected by the young."

" All large insects seemed to be put in the gape head first. The young had to gulp several times to swallow completely white butterflies." The author also saw the parents swallow wasps and butterflies when prevented from giving them to the young.

C. I. EVANS (*ibid.*, p. 171) records the following observation :—

" Some years ago in Hampshire I watched Spotted Flycatchers, both young and old, feeding on Small Whites, and noticed that whereas the young gulped the insect down wings and all, the old bird nipped the wings off before swallowing the body : I heard the click of the beak as it cut and I picked up the severed wing."

A NOTE ON THE LYCAENID BUTTERFLY *MIMACRAEA MARSHALLI DOHERTYI*, ROTHSCH., IN KENYA COLONY, AND ON THE WET AND DRY FORMS OF *PRECIS OCTAVIA*

---

* The wasp was determined as probably *Vespa germanica* or *communis* [*vulgaris*] by the late Mr. S. Meade-Waldo of the Natural History Museum.

SESAMUS, TRIM., TAKEN *IN COITÛ* ON KILIMANJARO.—Prof. POULTON communicated the following note from a letter, written 10 May, 1929, by his friend Canon K. St. Aubyn Rogers, M.A., F.E.S. :—

"*M. m. dohertyi* has turned up again in small numbers [in the Nairobi district]. It should have been called 'equinoctialis,' as it always appears about the equinox and remains on the wing for two or three weeks only. I have never taken any intermediates, but Dr. V. G. L. van Someren has one out of more than a hundred."

Canon Rogers is here referring to his experience of this Lycaenid in Kenya Colony. On 12 January, 1918, he captured a most interesting intermediate between *marshalli*, Trim., and *dohertyi* at Kiboriani (4500 ft.), about 200 miles W. of Dar-es-Salaam. The right F.W. is represented in Fig. 7 of Dr. Eltringham's beautiful plate XII, in our 1924 *Transactions*. It is surprising that the intermediates are so rare at Nairobi when *marshalli* occurs in S. Kavirondo, where it was taken by Dr. S. A. Neave in the Kissii district (5000 ft.); also at Mbarara in Ankole, Uganda, where Dr. G. D. H. Carpenter captured examples in December, 1920.

Prof. Poulton also wished to call attention to an oversight in his remarks on the wet- and dry-season forms of *Precis octavia sesamus*, Trim., taken *in coitû* (*Proc. Ent. Soc. Lond.*, 3 (1928), p. 45). He had there stated that "such matings appeared to be extremely rare, and the [Nairobi] example exhibited to the meeting was the first he had seen." In using these words he had forgotten that such a pair was included in the very interesting series of *sesamus* captured by Canon Rogers on Kilimanjaro in Sept. 1905 and exhibited to the Society in the following year (*Proc.*, 1906, pp. lviii–lx). The male of the pair *in coitû* was a fresh wet-season form, the female a worn and notched, slightly intermediate, dry-season form.

BUTTERFLIES MIMICKING *DANAIDA CHRYSIPPUS*, L., in S.E. ANGOLA.—Prof. POULTON, said that he had obtained the following interesting records of captures from his friend Mr. G. Talbot, F.E.S., who was unable to come to the meeting :—

"1929, *June* 1.—I have obtained, from the collection made by Mr. Barns in S.E. Angola, the following data, on the relative abundance of *Pseudacraea poggei*, Dew., and its model *Danaida chrysippus*.

"*P. poggei*, 6♂♂, 10♀♀.
"*D. chrysippus*, 575♂♂, 40♀♀.

"These were mostly collected by natives indiscriminately during Sept. and Oct. 1928."

Mr. Talbot wrote a few days later :—"I enclose further details relating to *poggei*, and have also added notes on the ♀ forms of *H. misippus*, of which only four were captured. I regret that the mass of *chrysippus* was not sorted into localities when they were received so I cannot give any further data for them, but the bulk was obtained in the Moxico district, the first locality in the table on page 73."

[The entire absence of the var. *dorippus* from the Angola series of *chrysippus*, together with the presence of a single *alcippus*, is of much interest. The forms of the species and proportions of model and mimics may be instructively compared with those given by an indiscriminate collection made in 1898–99 by natives at Kayambi, Awemba country, N.E. Rhodesia, and recorded by Sir Horace Byatt in *Trans. Ent. Soc. Lond.*, 1905, p. 263, pl. XIV. The numbers given (*ibid.*, p. 264) are—367 *chrysippus*; 12 *chrysippus*, var. *dorippus*; 17 *poggei*; 7 ♀ *misippus*; 2 *misippus*,

Localities in S.E. Angola: 1928.	*Pseudacraea poggei*, Dew.	*Hypolimnas misippus*, L., ♀ f. *misippus*.	*Hypolimnas misippus*, L., ♀ f. *inaria*, Cr.	*Hypolimnas misippus*, L., ♀ f. *alcippoides*, Butl.	*Danaida chrysippus*, L., f. *alcippus*, Cr.
Moxico Dist., 4000 feet: September.	2 ♀				
Upper Lungwe Bungo River, 4400 feet: October.	3 ♂, 6 ♀	2 ♀ (Sept.)		1 ♀	
Upper Cubango-Cunene Watershed, 5500 feet: October.	1 ♀		1 ♀ (Nov.)		
Zambesi-Kasai Watershed, 4000 feet: October.	3 ♂, 1 ♀				1 ♂

♀ f. *inaria*. The distribution of *P. poggei*, as known at the date of publication, is recorded in *Proc. Ent. Soc. Lond.*, 1918, pp. v–xxii, where it is also shown that Dr. Neave's extensive series of model and mimics, collected in the S.E. Congo State and N.E. Rhodesia, is very similar to that from Kayambi, allowing for the fact that *chrysippus* was not freely captured while two others of its mimics were taken—*Acraea encedon*, L., and *Mimacraea marshalli*, Trim. Dr. G. D. H. Carpenter's discovery that *poggei* has developed the *dorippus*-like var. *carpenteri*, Poult., to the N. and E. of the above localities is also announced in the same communication. The appearance of this form, as *poggei* approaches the eastern area where *dorippus* preponderates over *chrysippus* is of great interest.—E. B. P.]

THE ATTACKS OF MANTIDS ON BUTTERFLIES IN KENYA COLONY.—Prof. POULTON said that he had recently received a letter from Major K. A. C. Doig, F.E.S., in which the following observations were recorded :—

"22 *February*, 1929 : *Karundas Estate, P.O. Nyeri, Kenya Colony.*

"Since settling down here I have been watching butterflies and birds carefully, but have so far failed to see a bird actually capture a butterfly. Six times in the past year I have seen lizards do so, and have noticed quite a number of butterflies with large pieces of their wings bitten out. I will collect some for you if you would care to have them. Three times in the past month I have come across a large Mantis with cryptic coloration, preying on butterflies. The first example was when I was walking through the forest and saw a male *Papilio dardanus*, Brown, fluttering on a bush. I thought the insect was caught up in a spider's web and went up to it with the intention of setting it free, but found it in the jaws of a large Mantis which was sucking the body juices. On two other occasions in the garden here a Mantis was sitting on a small plant with purple flowers, and feeding on a species of *Teracolus*, whilst on the ground were numerous wings of *Belenois mesentina*, other *Teracolus* and a few LYCAENIDAE.

"This is a good locality for both butterflies and birds, 6000 ft. above sea-level on the foot-hills of Mt. Kenia, with large areas of primeval forest and numerous streams."

STRANGE BEHAVIOUR OF CERTAIN BIRDS WHEN GIVEN DISTASTEFUL OR SPECIALLY PROTECTED INSECTS.—Prof. POULTON said that Mr. O. C. Ollenbach, F.E.S., had written to him from Dehra Dun, U.P., confirming the observations recorded in *Proc. Ent. Soc. Lond.*, III, p. 92, 1928) :—

"17 *April*, 1929.—I had a tame Himalayan White-crested Laughing Thrush (*Garrulax leucolophus*, Hardw.) for about eight years which used to behave in exactly the same way as described by Mr. B. B. Osmaston. When offered a red Chilli or a Hornet or Wasp he would seize it and rub it several times under his tail, and in doing so often lost his balance. There was nothing strong-smelling about the Hornet or Wasp. If offered a live Scorpion he immediately picked off the sting and then proceeded to break it up and eat it."

It was interesting that other methods of defence, such as a sting, should have evoked in the bird the same behaviour as that caused by a strong-smelling secretion.

A MALE OF THE PIERINE BUTTERFLY *COLIAS LESBIA*, F., WITH BOTH FORE-WINGS SYMMETRICALLY PERFORATED.—Prof. POULTON exhibited a specimen of *C. lesbia* in which a small hole had been pierced at the outer end of the left F.W. cell and a still smaller one in the same position on the right side. It was evident that the wings had been perforated when they were in contact, and, if the injury was inflicted during life, the most probable implement was the slender beak of a bird. The butterfly was captured, 19 April, 1928, at Villa Ana, Prov. Santa Fé, in the Argentine, by Capt. K. J. Hayward, F.E.S., who suggested that the holes may have been made by the beak of a humming-bird. The margin of the holes was sharp and their whole appearance very different from that of the round or oval perforations occasionally seen on butterfly wings and probably caused by an injury inflicted on the soft unexpanded membrane shortly after emergence from the pupa.

[Since the above was written further interesting details have been received from Capt. Hayward, who wrote from Buenos Aires :—

"11 *July*, 1929.—The insect was taken wild with the two symmetrical holes. I thought at the time it might interest you and for that reason preserved it.

"As far as I can remember without consulting my notes, it was taken on the same day as the gynandromorph *lesbia* I sent to Mr. H. J. Turner and on which he and Dr. Cockayne wrote notes in the *Ent. Record*. It was a lovely sunny Sunday morning, and as there was little doing about that time in the forest, I spent a couple of hours going over *C. lesbia* on two patches of alfalfa we had near the house, adjoining lots, one of 100 metres square, the other about a third the size, the only alfalfa in the district at that time. I was very well rewarded, as apart from the beautiful gynandromorph, I took several very unusual colour-shades which I sent on to Turner. Further, there had been an early morning emergence, and the 'copper sheen' on these specimens was deeper and more marked than I had ever noticed before. As usual, 'white' females exceeded the yellows by at least 3 to 1 if not in higher proportion. I *think* I saw what may have been another gynandromorph between a male and a white female, but although I spent a good time searching for it, having spotted it—or rather something unusual about the insect—as it flew past, I never saw it again."]

FEMALES OF *HYPOLIMNAS BOLINA*, L., STILL PREDOMINANT AT SUVA, FIJI. A MENACING FIJIAN PRIONID BEETLE.—Prof. POULTON said that he had received the following notes in a letter written at Suva by his friend Mr. H. W. Simmonds, F.E.S. :—

" 17 *April*, 1929.—There have been several of those nice yellow ♀ *bolina* about recently, and I also saw one almost white. My efforts to catch them have however failed entirely, although I did get one nice one of the usual Suva type. I now have 185 eggs from this Fam. A, of 1929. I have seen no ♂ *bolina* for ever so long.

" I also had a big Prionid beetle given me, which, when it smelt the chloroform I was about to use on it, turned at me, with widely open jaws, making at the same time a loud noise. I have often had PRIONIDAE make a noise when handled, but never threaten, as this did, before being touched."

THE GREAT PREDOMINANCE OF LYCID BEETLES AS MODELS FOR MIMICRY IN AUSTRALIA.—Prof. POULTON said that Mr. A. M. Lea, F.E.S., in a letter written 18 April, 1929, had emphasised the far-reaching importance of the Lycoid association, as follows :—

" LYCIDAE.—Taking *Metriorrhynchus rufipennis*, F., only, and there are many other interesting species of the genus; we get :—

" Model. *M. rufipennis.*—Abundant, variable in size and colour; prothorax 7-areolate, subsutural costa parallel with suture, rostrum short. Typical form black, elytra brick-red : vars., elytra varying till entirely black. Also many species of genus similar in colour to the typical form or varieties, but with rostrum long to absent, and prothorax 3- or 5-areolate.

" *Trichalus.*—Subsutural costa on each elytron trifurcate near base.

" *Catochromus* and *Dumbrellia.*—Pronotum not areolate.

" All the above models and mimics are Lycides and presumably distasteful.

" CANTHARIDAE.—*Zonitis* (several spp.). Presumably these mimics are also distasteful. Mostly rare.

" OEDEMERIDAE.—Several species of *Pseudolycus* and *Morpholycus* exactly imitating these LYCIDAE in colour and size. Two species of the former genus with many parallel varieties of which several are abundant.

" CERAMBYCIDAE.—Several species commonly occurring in this association.

" Diptera, Moths, Neuroptera, and Hymenoptera.—Also include several species associated with the above LYCIDAE and resembling them when at rest."

Some conception of the importance of these Australian models and mimics may be gained from the rather rough figures, 56–95, on Plate I of Mr. A. J. Nicholson's paper in the *Australian Zoologist*, Vol. V, Pt. i, Nov. 1927, and from his remarks on pp. 38–43, in which, however, the Lycid beetles are throughout spoken of as Lampyrids.

The South African Lycidae were many years ago shown by Dr. G. A. K. Marshall, C.M.G., F.R.S., to be predominant models with a large assemblage of varied mimics, as illustrated on Pl. XVIII, figs. 1–52, and described on pp. 515–518 of *Trans. Ent. Soc. Lond.*, 1902. Dr. G. D. H. Carpenter has since proved that this powerful association of allied and identical species extends into the African tropics.

The Bornean Lycidae and their mimics were described by the late Robert Shelford, M.A., C.M.Z.S., in *Proc. Zool. Soc. Lond.*, 1902, pp. 242–250, and illustrated on Pl. XXIII, figs. 1–29.

The Lycidae of S. America are also known to supply models for several species, but they have not as yet been sufficiently studied from this point of view to enable us to determine whether their associations are as important as those of the Old World. Further evidence on this subject would be of much interest.

Aphids and Hover-Flies in North-East Land (Spitsbergen) in 1924: an Additional Note by Charles S. Elton, M.A., F.E.S.—[Prof. Poulton in the absence of the author communicated the following paper]:—

In the *Transactions of the Entomological Society* for 1925 (pp. 289–299), an account was given of a remarkable swarm of Spruce Aphids (*Dilachnus piceae*, Pz.) and Hover-Flies (*Syrphus ribesii*, L.), which reached North-East Land on the wind from the north of Europe, in August 1924. The swarms were encountered by the Oxford Expedition sledging parties during their journeys into the interior of the ice-cap of that island. Since dispersal of insect swarms on this scale, and over such great distances (in this case more than 800 miles) is of considerable interest, it was thought desirable to publish here two additional facts which have come to light since the publication of the paper mentioned above.

As was stated in that paper, it happened that Dr. Koefoed of the Norwegian Fishery Research Expedition in the Barents Sea was able, in the summer of 1924, to effect a landing on Hope Island (which is not often accessible, owing to ice-conditions). Here, on August 13th, he observed specimens of *Syrphus* walking about on the ground. Now, the North-East Land flies and Aphids were first observed on the 8th and 9th, and it seemed certain that the Hope Island specimens belonged to the same swarm, since this small island lies between Europe and Spitsbergen. At the time, however, it was not possible to get the specimens identified. Since then they have been examined by Dr. L. R. Natvig, Conservator of the Entomological Department in Oslo Zoological Museum, who writes as follows: "As to the Syrphid, I have examined the collections from Hope Island and have found one specimen of Syrphidae. On the label is written '. . . The banded one caught from the cabin wall; of this species we have seen three specimens on the slope of the hill on the eastern side of the valley (Husdalen) and perhaps also one specimen on the plain (in the upper part of Husdalen).' I have examined the specimen and find that it agrees with the description of *Syrphus ribesii* (♂), but am not a specialist in this group myself."

The explorations of Dr. Koefoed and Captain Iversen, carried out at the same time, leave no doubt of the extremely arctic and barren conditions prevailing on this island, and there cannot be any doubt that *S. ribesii* was blown there and could not have lived long on the island. The occurrence of these Hover-Flies on the island, which lies between North-East Land and Europe, thus completely confirms the other evidence which points to their origin from some place like the Kola Peninsula. Another fact which has come to light, is that Parry also encountered living Spruce Aphids, when he was sledging towards the North Pole in July 1827—just 97 years before the Oxford Expedition. His course lay northward along the sea-ice to the west of North-East Land, and the occurrence of the Aphids is mentioned in two places in his book on the expedition (W. E. Parry, *Narrative of an Attempt to reach the North Pole . . . in the Year* 1827, London, 1828). In the Appendix on Zoology, by James Ross (page 201), there is a note which says that the only insect obtained during the voyage had been submitted to Mr. J. Curtis, who gave the following description of it : " *Aphis borealis*, Curtis's MSS. *Corpus magnum, atrum, hirsutum, femoribus basi ferrugineis : alis magnis, subfuscis, ad costam atris.* At first sight this insect might be mistaken for *A. piceae* of Panzer, which it resembles in size and colour. Upon a closer examination, however, it will be seen that the whole surface, excepting the wings, is covered with rather long and somewhat hoary tomentum or pubescence; and the base only of the thighs is ferruginous; whereas, in *A. piceae*, the whole insect is naked, and the antennae, thighs and tibiae are ferruginous or reddish at their base."

Ross goes on to say, " the circumstance of the *Aphis borealis* having been found on floating floes of ice in the Polar Sea, at one hundred miles distance from the nearest known land, and as far north as 82° 45′, renders it in a more than ordinary degree interesting. Its very near resemblance to the *Aphis piceae*, which feeds on the silver fir (*Pinus picea*, Linn.), whence it derives its name, would induce the belief that the floating trees of fir, that are to be found so abundantly on the shores and to the northward of Spitzbergen, might possibly be the means by which this insect has been transported to the northern regions. It was never seen on the wing, and the few specimens that were obtained were in a very languid state, but revived by the heat of the hand."

Earlier on in the book (p. 87), Parry records what was clearly the occurrence (or one of the occurrences) of these Aphids, when he says, " a couple of small flies (to us an event of ridiculous importance) were found upon the ice." This was on July 16th, 1827. The wind for the previous week had been almost continuously from the east, east-south-east, or south-east, which would serve to bring the Aphids, from the north of Russia or Siberia, east of the Kola Peninsula. The " flies " recorded by Parry were in latitude 82° 27′ approximately, which is further south than the latitude given by Ross. Perhaps more were observed later on in their sledging journey, but not noted by Parry in his journal.

At any rate, it seems pretty clear that the dispersal of huge swarms of Aphids must be a fairly frequent phenomenon in Northern Europe, if the two biggest English Expeditions to Spitsbergen, a hundred years apart, each happened to meet with them.

[Mr. F. Laing, after reading this communication, informed me that he entirely agreed with the author's conclusions and had no doubt that " *Aphis borealis* " of Curtis was the same species as *Dilachnus piceae* and that the name should now be added as a hitherto overlooked synonym of the latter.—E. B. P.]

THE LARVAE OF *COLORADIA PANDORA*.—Dr. J. M. ALDRICH of the U.S. National Museum, a visitor, exhibited specimens of the larvae of the Saturniid moth, *Coloradia pandora*, Blake, which are still used as food by Californian Indians. The specimens shown had been dried for preservation by the Indians. The insect has a two-year life cycle, the larvae wintering in the tops of pine trees (*Pinus jeffreyi*) when about half grown.

A FLY THAT HAS DEVELOPED MANDIBLES.—Dr. ALDRICH also showed a specimen of the Dolichopodid fly, *Melanderia mandibulata*, Aldrich, which occurs on the shore of the Pacific Ocean near the mouth of the Columbia River in the State of Washington. This fly has the lower part of the labium developed into pointed structures which function as mandibles, and greatly resemble those organs as occurring in ground beetles.

NEOCLYTUS CAPREA AND OTHER LONGICORNS INFESTING TIMBER.—Dr. R. STEWART MACDOUGALL exhibited a number of examples of timber that had been damaged by various Longicorn larvae, including *Callidium violaceum, variabile* and *Phymatodes sanguineus*, the two last taken from stored unseasoned timber. Mention was made of the ease with which species whose larvae work in wood and in the cambial region can be transported in commerce, and as an example, ash wood was shown that had been attacked by the American Longicorn *Neoclytus caprea*. This English ash had been stacked for some time alongside imported American ash. *N. caprea* had been found on examination in the American ash logs, and some time after the removal of these, *N. caprea* was found breeding in the English ash.

Dr. H. SCOTT gave an account, illustrated by numerous lantern slides, of an entomological excursion into Basutoland.

Wednesday, October 2nd, 1929.

Dr. K. JORDAN, President, in the Chair.

In opening the meeting, the PRESIDENT expressed the regret of the Council that the Society was not yet able to meet in its new Meeting Room, and explained the circumstances that had rendered this impossible.

Election of Fellow.

The following was elected a Fellow of the Society :—W. E. HAMLIN, 12, Wimbledon Hill Road, S.W. 19.

Exhibits.

NEW BRITISH HYMENOPTERA AND COLEOPTERA.—Mr. DONISTHORPE exhibited :—

1. In connection with a nest of *Acanthomyops* (*Dendrolasius*) *fuliginosus*, Latr., which he had taken in Windsor Forest, some of the yellow carton of which the nest was formed, and some ordinary black carton from another nest for comparison ; a fine new species of *Paxylomma* of which he had taken three specimens hovering

over the ants, and several specimens of the known British species *P. buccata*, Bréb., taken with other ants, and gave a short account of their habits; also a number of a small new species of *Ptilium* taken in company with the ants.

2. A specimen of *Gymnetron lloydi*, Donis., *Ent. Rec.*, **41**: 125, 1929, taken in Windsor Forest 16.vi.29.

3. A number of specimens of *Longitarsus nasturtii*, F., var. *obscura*, Donis., *Ent. Rec.*, **41**: 126, 1929, swept off *Symphytum officinalis* (common Comfrey) in Windsor Forest 16.vi.29.

A FEMALE *DANAIDA CHRYSIPPUS*, L., TAKEN *IN COITÛ* WITH A DEAD MALE, BY CAPT. KENNETH J. HAYWARD.—Prof. POULTON said that he had received a letter from Capt. Hayward, referring to the observation recorded in *Proc. Ent. Soc. Lond.*, Vol. IV, 1929, pp. 7–8, and drawing his attention to the capture of a female *D. chrysippus* paired with a dead male (" Notes on Egyptian Lepidoptera," etc., *Ent. Rec.*, 1925–26, Suppl., p. 10). As in the pair of *D. limniace*, Cram., taken by Major Fraser, the male *chrysippus* " was quite dry so that death had in all probability taken place two days before the capture was made. The insect was taken at 11.30 a.m. during the hot weather." Capt. Hayward considered that the same explanation—the attack of a flower-haunting spider—probably accounted for his experience.

THE PENTATOMID BUG *TROILUS* (*PODISUS*) *LURIDUS*, F., PERSISTENTLY DEVOURING A NOCTUID LARVA, AFTER FALLING INTO THE BEATING-TRAY.—Prof. POULTON exhibited a female of this bug, together with the shrivelled remains of its prey, kindly sent to him by his friend Dr. E. A. Cockayne, D.M. The following note, written 22 Sept. 1929, accompanied the specimens :—

" The enclosed bug was sucking the posterior end of the larva, which is, I think, a young *Phlogophora meticulosa*, L. I beat it from hazel at Boxhill to-day. The bug went on sucking even on the beating-tray, let go when I boxed him, but returned to the feast in a minute or two."

The larva of this Pentatomid is recorded as feeding on the nearly mature larva of the Lymantrid moth *Orgyia antiqua*, L., which it was still sucking (and continued to do so for an hour), when it fell into the beating-tray. Similar larvae, probably of this species, have also been commonly observed devouring caterpillars of smaller size than the *antiqua*; also the Chrysomelid beetle *Phyllodecta vitellinae*, L. (*Trans. Ent. Soc. Lond.*, 1906, p. 404).

E. A. Butler also records as prey the larvae of PYRALIDAE and of *Lymantria monacha*, L., and the beetle *Galerucella viburni*, Payk., as well as the larva of another Pentatomid bug, the non-predaceous *Piezodorus lituratus*, F. *T. luridus* was afterwards bred upon this prey as food (*Biol. Brit. Hemipt.-Heteropt.*, p. 72, 1923).

A further addition to the recorded prey is contributed by Mr. Joseph Collins, who informs me that he has bred *T. luridus* to maturity on houseflies.

THE ORDERLY AND DELIBERATE METHODS OF THE ANT *MEGAPONERA FOETENS*, F., IN ITS ATTACKS ON TERMITES.—Prof. POULTON communicated the following observations extracted from a letter recently received from his friend Dr. G. D. H. Carpenter :—

"4 *August*, 1929 : *Entebbe, Uganda.*

" Your mention of *Megaponera* reminds me of an evening on this last safari, at Paichor camp, about 12 miles from Gulu Station. A column emerged from burrows on one side of the road, obviously led by one ant who knew where to go. The column went across the road to the other side, where, for some reason I couldn't see, a lot of minute (? probably young) workers of a small species of termite, attended by a few soldiers, were aimlessly wandering about on the surface. When the *Megaponera* arrived, they at once set to work in a most deliberate manner to sting these soft little workers one after another and put them down again. What particularly interested me was the apparent uselessness of the feeble soldiers (a kind with long straight mandibles). They seemed unable to *attack*, and merely feebly moved their heads about, and, if an ant came within touch, snapped. The ants most obviously deliberately left them alone, and if a termite snapped, the ant just avoided it and went on capturing and stinging workers. After a while the ants set to work to collect ' bundles ' of the termite corpses, and then formed up again and crossed the road back to the nest. They did not, I think, take any soldiers back with them, and indeed seemed to look on them as the Kaiser looked on our Expeditionary Force ! In other cases, where larger termites are the prey, the more powerful soldiers do achieve a certain mortality among the ants, and are often seen to be carried home as prey. This probably happens when the ants definitely invade the nest, and the soldiers of course are likely to be the first encountered. As usual, the orderly methods of *Megaponera* filled me with admiration—it seems to know so very well exactly what it wants to do ! "

THE NESTING-TOGETHER OF BIRDS, WASPS AND ANTS.—Prof. POULTON, in the absence of his friend the author, communicated the following paper by Dr. J. G. MYERS :—

1. *Introduction.*

In works of travel on Tropical America reference is not infrequently made to the pendent nests of certain American orioles (ICTERIDAE) built in close proximity to the equally conspicuous nests of large wasp-colonies (social VESPIDAE). The writer has taken the opportunity during recent journeys in Trinidad and the Guianas to examine as many cases as possible, with a view to ascertaining whether the association of these and other birds' nests with those of stinging or biting Hymenoptera can be dismissed as accidental or is of such regular occurrence that it must be attributed to the definite choice of one of the parties concerned. A consideration of the data submitted below will indicate that the second alternative seems the only possible explanation.

2. *Review of the Literature.*

Only a limited literature has been available to me, and an exhaustive search has therefore not been possible, but it is believed that the selections given below are sufficiently representative.

Of the older naturalists, Belt, in Nicaragua, seems to have given the matter the most consideration. He writes (1874, pp. 290–291) as follows, on the placing of birds' nests :—

"The various prickly bushes are much chosen, especially the bull's-horn thorn, which I have already described. Many birds hang their nests from the extremities of the branches, and a safer place could hardly be chosen, as with the sharp thorns and the stinging ants that inhabit them no mammal would, I think, dare to attempt the ascent of the tree. Stinging ants are not the only insects whose protection birds secure by building near their nests. A small parrot builds constantly on the plains in a hole made in the nests of the termites, and a species of fly-catcher makes its nest alongside that of one of the wasps. On the savannahs, between Acoyapo and Nancital, there is a shrub with sharp curved prickles, called *Viena paraca* (come here) by the Spaniards, because it is difficult to extricate oneself from its hold when the dress is caught: as one part is cleared, another will be entangled. A yellow and brown fly-catcher builds its nest in these bushes, and generally places it alongside that of a banded wasp, so that with the prickles and the wasp it is well guarded. I witnessed, however, the death of one of the birds from the very means it had chosen for the protection of its young. Darting hurriedly out of its domed nest as we were passing, it was caught just under its bill by one of the curved hook-like thorns, and in trying to extricate itself got further entangled. Its fluttering disturbed the wasps, who flew down upon it, and in less than a minute stung it to death. We tried in vain to rescue it, for the wasps attacked us also, and one of our party was severely stung by them. We had to leave it hanging up dead in front of its nest, whilst its mate flew round and round screaming out terror and distress. I find that other travellers have noted the fact of birds building their nests near colonies of wasps for protection. Thus, according to Gosse, the grass-quit of Jamaica (*Spermophila olivacea*) often selects a shrub on which wasps have built, and fixes the entrance of its domed nest close to their cells; and Prince Maximilian Neuwied states in his *Travels in Brazil*, that he found the curious purse-shaped nest of one of the Todies[*] constantly placed near the nests of wasps, and that the natives informed him that it did so to secure itself from the attacks of its enemies. I should have thought that when building their nest they would be very liable to be attacked by the wasps. The nests placed in these positions appear always to be domed, probably for security against their unstable friends."

The botanist, Richard Spruce (1908, Vol. II, pp. 44–45, footnote) noticed at Tarapoto, in the Eastern Andes of Peru, that the tree, *Erythrina amasisa*, Spruce, was frequently selected by the "sagacious troopial" (*Cacicus*[†] (*Cassicus*) *icteronotus*) for its pensile nests, on account of the prickles on its trunk. He continues, "all the species of troopial I have seen on the Amazon and Rio Negro show similar foresight in selecting a place where to rear their infant colonies, and the robber who, observing no impediment from below, ventures to climb to their eyrie finds to his cost that it is defended by some large wasps' nest, or by hordes of stinging ants."

Miller (1919, p. 170) made a similar observation on the Orinoco, ". . . Some times a single tree contained thirty or more nests [of *Cacicus*] placed close together, and also invariably a number of large wasp-nests were placed in the same tree."

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[*] There is some confusion here. These birds cannot be Todies, which do not build purse-shaped nests, and are confined to the West Indies.—J.G.M.

[†] Very many ornithologists spell this generic name "*Cassicus*." According to Ridgway, however, the original name was *Cacicus*, Lacépède, 1799, of which *Cassicus*, Illiger, 1811, is a synonym (*Birds of North and Middle America*, Part II, p. 186, 1902). Throughout the rest of this paper a uniform spelling of "*Cacicus*" will be adopted.—J.G.M.

Roosevelt, on the headwaters of the Paraguay River, found " black and golden orioles, slightly crested, of two different species," nesting in colonies. " Cherrie told us of finding such a colony built round a big wasp-nest, several feet in diameter. These wasps are venomous and irritable, and few foes would dare venture near birds' nests that were under such formidable shelter; but the birds themselves were entirely unafraid, and obviously were not in any danger of disagreement with their dangerous protectors."

Most of the references, however, come from British Guiana, where the association seems most general, or perhaps the birds are more plentiful. Barrington Brown's observations (1876, pp. 353–354), on the Correntyne River, are among the most detailed. " The long and barrel-like nests of a wasp, called the boraserie, were frequently seen suspended from the branches of trees. As a rule, their form was that of a long truncated cone of about eighteen inches in diameter and three feet in length. . . . It was impossible to go near enough to one to get a good look at it, for its inhabitants did not belie their name, but were very waspish. The wasps were of a dark colour with brown abdomens, and stung like fiends, as I found to my cost when examining some rocks one day, under a tree in which a nest was suspended at least fifty feet up.

" There was always a large spindle-shaped ants' nest attached to a branch close to these wasps' nests. The ants inhabiting them are probably the small amber-coloured kind so frequently met with, which when touched emit such a disagreeable resinous smell.

" What feelings the two kinds of insects can have in common, that they should live together in harmony, it is hard to understand, unless it be that they mutually protect each other.

" This social group requires the mention of a third party to make it complete, and this is no other than the yellow-backed mocking-bird (*Cassicus persicus*). Around and almost touching the habitation of the wasps are the long hanging nests of these birds, in and out of which, during the breeding season, their owners go with impunity. The wasps, by their presence no doubt, protect the young and eggs of the bird from the attacks of monkeys, but of what service the bird is to the insect is not so easily understood. It seems strange that the wasps should tolerate the presence of such busy, noisy, chattering neighbours."

Quelch, in the same colony, writes of the red-rumped (*Cacicus haemorrhous*, L. (*affinis*) and the yellow-backed, orioles (*C. cela*, L.) (= *persicus*). He states (1901, p. 133): " It is a curious fact that almost invariably these nests are found built in the immediate vicinity of the nests of stinging ants and wasps which render them safe from molestation, though the insect homes are often so hidden that it is difficult to perceive them until the attempt to secure the birds' eggs has been made." Mr. F. Urich has made the same observation regarding *Cacicus cela* in Trinidad.

Of *Cacicus cela* (*persicus*) im Thurn (1883, p. 122) writes, in British Guiana: " These birds build in colonies, and, it is said, always on trees on which there are nests of certain venomous wasps, these insects being useful in that they deter monkeys from attacking the nests of the birds."

Lloyd (1897, p. 5), also in British Guiana, observes that " most of our Cassiques resort to trees already occupied by colonies of wasps for the purpose of building their nests. I suppose this is for protective purposes, but then, why have not all of our birds developed the same habit? A marauding monkey or snake would be just as likely to attack or rob the nest of a pigeon or dove as it would that of a Cassique."

The remaining citations concern other birds than the Icterids. Of the common kiskadee (*Pitangus sulphuratus*) (family TYRANNIDAE) Cleare (1923) states that "very often one finds these nests close to large nests of wasps, but it would be difficult to say if there is any deliberate selection of such places on the part of the birds."

Of four nests of the equally common grey-headed kiskadee (*Tyrannus melancholicus*, Licht.) found by Williams (1922, p. 145) in Trinidad, two were "close to the nest of the common Jack Spaniard (*Polistes*)."

Beebe (quoted by Chubb, Vol. I, p. 377) found the pendent nest of the little swift (*Panyptila cayennensis*) in British Guiana "suspended from the palm thatch, not half a foot from a hanging, open-comb wasps' nest. . . ." This is an isolated reference for this species, and as *Polistes canadensis* nests are often so plentiful on houses, the association here may quite likely have been accidental. This case may well be dismissed.

There are more frequent references in the case of another family of birds, the SYNALLAXIDAE. Lloyd (1897, p. 6) writes that "the little spine-tail (*Synallaxis cinnamomea*) . . . builds its cumbersome nest in close proximity to those of wasps, and singularly enough, as if not satisfied with the protection afforded by these pugnacious neighbours, it invariably *attaches* a portion of the cast skin of a snake on the outside, possibly as an additional warning to its enemies." Williams (1922, p. 150) has also remarked on the pieces of snake skin in nests of these birds (*Synallaxis* spp.) in Trinidad, but is not certain whether these are "brought by the birds or whether snakes about to cast their skins find the mass of twigs forming the nest a convenient brush for removing the old skin."

There is one record which concerns the curious Ani, or tick-bird (*Crotophaga ani*, L.), a nest of which was found by Williams (1922, p. 174) in Trinidad. "Several birds were round the nest, but owing to the presence of a large wasps' (*Polistes*) nest alongside, I was unable to examine it."

3. *New Observations.*

The association of Icterids with wasps and (or) ants in British and Dutch Guiana.

The Icterids concerned were the yellow-backed oriole (*Cacicus cela*) and the red-rumped oriole (*C. haemorrhous*). It frequently happens—perhaps more frequently than not, but on this I have no figures—that these two nest in closely combined, mixed, interpenetrating colonies, as noticed long ago by Schomburgk.

I saw no signs of wasp- or ant-nests in the colonies of the large Icterid, *Ostinops decumanus*, Pall., either in Trinidad or in the Guianas. The much longer nests of this species are usually hung from the tops of the tallest trees, the silk-cotton (*Eriodendron anfractuosum*) being frequently chosen, and in Trinidad the immortelle (*Erythrina micropteryx*). When, as sometimes happens, there is a colony of *Cacicus cela* and (or) *haemorrhous* in the same tree, the nests of stinging Hymenoptera, if present, are invariably to be found in the midst of the *Cacicus* nests. Yet Chubb (1921, Vol. II, p. 550) quotes Schomburgk (giving a reference which I have not been able to find) to the effect that " these birds " select for their nests the same trees and the same branches on which " *Vespa nidulans* " and " *V. morio* " have already made colonies. It is possible that " these birds " is meant to denote colonial ICTERIDAE in general.

One of the first cases of the *Cacicus*-wasp-ant association, which I was able to examine in some detail, may be taken as a typical example. It was in a small rubber tree (*Hevea brasiliensis*) planted in the garden of the Government Station at the junction of the Baramanni and Waini Rivers, in the North-west District of British Guiana. The garden was backed by forest which extended unbroken for many miles between the rivers. The choice of such a situation is in keeping with the birds' preference for sites on or near cultivations. There were at least a hundred nests in this tree, but they were hung so close together, in places touching in masses, that counting was very difficult. Apparently all belonged to the red-rumped oriole (*Cacicus haemorrhous*). Right in the midst of the colony, and about two feet from the nearest nest, was hanging a large carton nest of the social Vespid, *Polybia rejecta*,* F., about a foot long, with a circular opening in the bottom of the envelope, which invested it completely. In addition, on the same and adjacent branches, there were no fewer than three large and several small carton nests of the ant, *Azteca chartifex laticeps*,* Forel. Three feet lower down, in the main fork of the tree, was a much larger *Azteca* nest, built about the base of a large Bromeliad, and evidently the centre of the ant-colony. In obtaining specimens by means of a ladder, I was attacked by some numbers of both ants and wasps.

At Mabaruma, British Guiana, in a small tree about 40 feet high, in the roadside second-growth bush, was a combined colony of about 25 nests of *Cacicus haemorrhous* (in the majority) and *C. cela*, and in their midst a *Polybia* nest of probably the same species, over a foot long and nine inches in diameter, but quite inaccessible.

Mr. T. W. Whittingham, District Inspector of Police, told me of another colony in the same district, with a large " marabunta " nest in the centre.

While travelling by boat in this part of British Guiana I made several surveys of the *Cacicus* colonies which could be examined along the banks by means of field-glasses, or in many cases, even without. The nests were most abundant in the lower reaches, where the dominant and almost the only trees on the actual water-front were mangroves (*Rhizophora mangle*), behind which were occasional small agricultural holdings. Higher up the rivers, when the mangroves ceased and the virgin forest was untouched, they were almost absent.

The biggest count was made on 2nd April, 1929, along about 40 miles of river in British Guiana, extending from Cumaka on the Aruka River, down a few miles to the Barima, and up this to Koriai Creek, above which *Cacicus* practically disappeared. There is extreme uniformity, not to say monotony, in the mangrove association, and objects like *Cacicus* nests and the large nests of social wasps, *Azteca* and termites are easily detected and as readily distinguished. It occurred to me that we should have a good check on the regularity of the association between *Cacicus* and wasps and ants if all nests of these three were counted, and also those of the termites, for if the association was merely an accidental one, it ought to occur even more frequently with the termites than with the wasps and ants, for the termitaria were much the more numerous. Owing to the fact that the *Azteca* nests often had several quite large outliers, all nests in one tree were counted as one, and it was thought advisable to treat the wasps in the same way, though in their case the nests doubtless represented different colonies. The following are the figures obtained :—

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* These two insects were compared with specimens in the collection of the Government Entomologist, Mr. L. D. Cleare, Jr., at Georgetown, determined through the Imperial Bureau of Entomology (the ants, by W. C. Crawley).

Total number of *Cacicus* colonies : 9 (1 alone ?);
,, ,, *Polybia* nests : 8 (1 alone);
,, ,, *Azteca* colonies : 28 (21 alone);
,, ,, Termite colonies : 133 (all alone).

Associations (in the same tree, and usually on the same branches) of

Cacicus with *Polybia* alone : 2;
,, ,, *Azteca* alone : 2;
,, ,, *Polybia* and *Azteca* : 4;
Azteca with *Polybia* alone : 1;
Termites with any of the other three : nil.

The single *Cacicus* colony in which I could not see either ant- or wasp-nests was so far distant that I could not examine it properly.

No other river was found so favourable for these observations as the lower Barima. Termite nests, in view of the above conclusive figures, were not counted again; nor were the numerous *Azteca* nests not in association, nor the *Polybia* nests, of the identification of which, in the usual absence of specimens, I was less certain than on the uniform stretch of the Barima, examined above; but the following include all my other counts of *Cacicus* colonies, in the North-west District of British Guiana and on the Coppename River and Kwamma Kreek in Surinam.

Total number of *Cacicus* colonies : 8 (3 too far distant to examine properly).

Associations of

Cacicus with *Polybia* alone : 2;
,, ,, *Azteca* ,, : 2;
,, ,, *Polybia* and *Azteca* : 1;
Azteca with *Polybia* alone : 1.

It is probable that the figure for the association of *Cacicus* with ant- and wasp-nests together is too small, for occasionally one of the latter could be distinguished in a *Cacicus* colony which was still too far distant or too massed to make a thorough examination, and which might therefore have contained a nest of the others also.

It seems to me, however, that, even in their present imperfect state, the above figures show clearly,

(*a*) that the association is not an accidental one;

(*b*) that the main selective agency is that of the Icterids, which almost invariably build their nests close to those of aggressive Hymenoptera;

(*c*) that the ants take no part in the selection, since more of their nests occur alone than in association with either birds or wasps;

(*d*) that the wasps do sometimes definitely select the immediate vicinity of *Azteca* colonies, for building their nests.

The last is a startling, but I think inevitable conclusion. Apart from the observations on the Barima, in the first table above, where I could be reasonably certain of the identity of the species, I have no information as to the proportion of *Polybia* nests of this and related species occurring alone, but they are unquestionably less than in *Azteca*. The fact, however, that there are six cases above, of *Polybia* in association with *Azteca* (with or without *Cacicus*), while not one occurred in the immediate vicinity of any of the much more numerous termite nests in the same situations, shows that the association can hardly be a random one. One case, involving two large *Polybia* nests, was particularly striking. It was seen among the mangroves of the lower Waini River (British Guiana). In one tree were two large inverted conical *Azteca* nests, of the usual type, one on a lower branch and the other on a higher. Practically touching each, and hung a little further out on the branch, was a large *Polybia* nest.

If there be definite selection here, it seems evident, from what has gone before, that this is on the part of the wasps. The problem may be looked at from another angle, which is again, however, not so illuminating as it might be, were more data available.

The large *Azteca* nests must be of a very great age—at least a number of years. Not only is the main nest often gigantic, but there may be subsidiary nests in some number and of considerable size. The wasp-nests, though probably usually enduring more than a year, can hardly be so old. The two Icterids apparently build new nests every year, though often, perhaps usually, on the same site. There are thus new grounds, though not final ones, for considering the ant-nests as the original structures on a given tree and the ants as the oldest partners in the association, or rather as flourishing independently before the wasps and the birds arrived.

Association of other birds with wasps.

Icterus xanthornus, Gm., is not a gregarious species, and its pendent nests are shorter than those of the two species of *Cacicus*. A large *Pithecolobium* tree in the Georgetown Botanical Garden had three nests of this species (two apparently old), and close to them a *Polybia* nest of moderate size. A little further away was a nest of the big black *Synoica*, a very aggressive wasp. There were two nests of the Common Kiskadee (*Pitangus sulphuratus*) on another branch of the same tree. Other trees of the same species had a number of long nests of a *Polybia*, of a different species from that associating with *Cacicus*, and with no birds' nests. The association here is therefore not very significant.

In the edge of a cocoa plantation in the south of Trinidad, I found (21st Feb., 1929) a smallish domed nest, containing one red-spotted egg, in a low bush. It was probably that of *Coereba luteola*, Cab. One foot away was hanging a particularly large nest of *Polistes canadensis* var. *amazonica*, one of the most formidable wasps in Trinidad.

4. *General Considerations.*

The nest-colonies of the Icterids and the large untidy nests of the kiskadees are conspicuous. I can vouch for the fact that so far as man is concerned the degree of protection conferred by the habit of building near wasp- and ant-nests is great. Whether it is as effective against other climbing mammals, there are no direct observations to indicate; but it seems more than probable that it is so.

The tolerant relations subsisting between the curiously assorted partners are perhaps less surprising than at first sight. The food-getting activities of the three groups seem to be almost entirely distinct. It is true that ants have been known to kill nestling birds (Beebe, 1917, p. 111; Hurlbutt, 1929, p. 116—ant-species not stated); while raiding ants (*Eciton* spp.) are recorded as attacking the nests of wasps * (Bates, 1892, p. 359; Beebe, 1921, p. 289-290). The ants of the genus *Azteca*, however, apparently do neither of these things; and may even ward off the attacks of ants which do. They are among the most assiduous attendants and keepers of homopterous insects, from which they obtain honey-dew.

It is possible that under the influence of a violent disturbance, the wasps may occasionally attack the birds, as in the case mentioned by Belt. The hanging nests of the Icterids, however, and the domed ones of the kiskadees must help the birds to avoid any very direct contact with the Vespids.

It is perhaps significant that the two groups of birds in which the habit is most regularly noticed—*Cacicus* and the kiskadees –are very adaptable, and, shall we say, intelligent, in other directions also. Thus Beebe (quoted by Chubb, Vol. II, 1921, p. 558) noticed *Cacicus haemorrhous* nesting in isolated trees *out in the water*—" a new method of protection on the part of these intelligent birds." The nesting of the two *Cacicus* species together, and their preference for the vicinity of cultivations may also be considered evidence of adaptability. Their habit of nesting near colonies of aggressive Hymenoptera is itself merely complementary to that of hanging their nests from the tips of branches—in itself an admirable protective device in a country where, as Bates long ago observed, such an extraordinary proportion of the fauna is arboreal.

The kiskadees, especially *Pitangus sulphuratus*, are very abundant and dominant birds; and the versatility of the latter species in the art of food-getting is truly amazing. As Quelch has remarked, in the towns it takes the place of the English sparrow. At the waterside it adopts the habits of a kingfisher and plunges bodily into shallow water for its prey.

Synallaxis, again, is extraordinary in its practice of ornamenting its nest with pieces of snake skin. It also is one of the forms which seems thoroughly to have adapted itself to the conditions of cultivation, and is as much at home in the cane-lands as in its native wilds.

To sum up, there can be no doubt that at least three different groups of South American birds which are in other respects highly adaptable and successful, definitely and more (*Cacicus*) or less regularly select the immediate vicinity of colonies of aggressive Hymenoptera for their nests. Furthermore, at least one species, the wasp genus, *Polybia*, tends regularly to place its nest close beside colonies of the ant, *Azteca chartifex*.

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* Yet on 15th April, 1929, when I found a Government Rest House in British Guiana (Pomeroon) in possession of a party of Ecitons, which had established a huge temporary bivouac in the kitchen, and were sending foraging parties all over the house, on the third day of the visitation, several nests of *Polistes canadensis* hanging from the ceilings and cornices were apparently unmolested.

REFERENCES.

BATES, H. W. 1892. *The naturalist on the River Amazons.* Repr. of unabridged ed., London.

BEEBE, W., HARTLEY, G. INNESS, HOWES, P. G. 1917. *Tropical wild life in British Guiana.* Vol. I (all published), 504 pp., 144 figs.

BEEBE, W. 1921. *Edge of the Jungle.* New York, [viii] + 303 pp.

BELT, T. 1874. *The naturalist in Nicaragua.* London.

BROWN, C. BARRINGTON. 1876. *Canoe and camp life in British Guiana.*

CHUBB, C. 1916–1921. *Birds of British Guiana.* 2 vols., London.

CLEARE, L. D. (Jr.). 1923. The Kiskadee, *Pitangus sulphuratus. J. Bd. Agric. Br. Guiana,* **16**: 181–184, 1 pl.

HURLBUTT, CATHERINE A. 1929. The chickadee's bedroom, parasitical ants, and a queer nesting-site. *Bird-Lore,* **31**: 116.

MILLER, LEO E. 1919. *In the wilds of South America.* London.

QUELCH, J. J. 1901. *Animal life in British Guiana.* Georgetown.

ROOSEVELT, T. 1914. *Through the Brazilian wilderness.* London.

SPRUCE, R. 1908. *Notes of a botanist on the Amazon and Andes.* 2 vols., London.

IM THURN, E. F. 1883. *Among the Indians of Guiana.* London.

WILLIAMS, C. B. 1922. Notes on the food and habits of some Trinidad birds. *Bull. Dept. Agric. Trin. Tob.,* **20**: 123–185, 5 figs.

Prof. Poulton said that he had, for many years, hoped that this interesting subject would be investigated as Dr. Myers has now investigated it in tropical America. The associations between birds and wasps appeared to bear directly upon the innumerable examples of mimetic resemblance to these Aculeates as models. His own attention to the subject was first aroused during the visit of the British Association to South Africa in 1905, when, in a visit to the fateful Acacia-grove on the Field of Colenso, he had observed examples of this association.

It seemed to him important to inquire how far there was evidence for the existence of analogous associations in other Regions as well as the Neotropical. He had therefore written to his friend Dr. V. G. L. van Someren, who had kindly replied, 7 September, 1929, with the following account, prepared in this country and without access to his notes :—

"I have several records of the association between birds and wasps as well as between birds and ants. The associations most in evidence are between the following birds and the wasp *Belonogaster griseus*, Fabr. :—

"The three races of the Red-cheeked Finch—*Uraeginthus bengalus brunneigularis*, Mearns; *b. ugandae*, Sedlitz; and *b. littoralis*, van Som.

"The Green-headed Manikin, *Spermestes cucullatus*, Swains.; and the Brown-backed Manikin *S. stigmatophora*, Reichenow.

"The Red Finch, *Lagonosticta ruberrima*, Reichenow, and its races enter associations with another species of wasp as well as with *B. griseus*; *Uraeginthus cyanocephalus*, Richmond, with a wasp of a species as yet undetermined.

"All these birds build the closed nest with a tubular entrance made of grass-stems with the heads directed outwards. The wasps' nest is as often below as above the bird's nest. The birds select a site where a wasps' nest is already in existence. I have other records about which I will write from Kenya later on."

Dr. van Someren believed that the only published instances of this association were contained in two papers by Arthur Loveridge, from which the following examples, chiefly recorded in the earlier, had been extracted:—"Notes on East African Birds (chiefly nesting habits and stomach contents) collected 1915–1919" (*Proc. Zool. Soc.*, **1922**: 837).

Uraeginthus niassensis, Reichw., Niassa-land, Bengali (p. 841)—At Morogoro, Tang. Terr., 19 out of 20 nests "were built over the paper nests of wasps, so that one could not approach one's hand through the thorns before the wasps began to threaten and fly round. I watched a pair of these birds building over a wasps' nest, and so am certain that it is not the wasps which build beneath the bird's nest for the sake of shelter from the rain, though doubtless the arrangement is mutually beneficial. At Mombasa, I have seen the same thing with *U. b. brunneigularis*, but at Nairobi, where one of these charming little blue weavers is very common, I never recollect having seen its nest above a wasps'. The same at Lumbo, where *U. b. angolensis* was very abundant and its old nests were to be seen in almost every thorn-bush." At Lorenzo Marques, however, he noted that a small blue bird, probably this species, "had built its nest in a thorn-bush just above that of a wasp."

Cisticola lugubris, Rüpp., Brown-headed Grass-Warbler (p. 846)—"From the interior roof of the [deserted] nest depended the paper nest of a wasp, whilst a small company of solitary bees had their comb in the bottom" (Ruaraka River, nr. Nairobi, 11.x.1919).

Lophoaëtus occipitalis, Daud. (p. 856)—The nest of this Crested Eagle was 80 ft. up on a tree. A swarm of bees hung from the big limb on which the nest was placed (Morogoro, T.T., 20.ii.1917).

The later paper by Mr. Loveridge—"Notes on East African Birds (chiefly nesting habits and endo-parasites) collected 1920–1923" (*Proc. Zool. Soc.*, **1923**: 899) recorded on p. 902 that a nest of *Lagonosticta senegalla*? was "built over that of some wasps . . . in a small tree and contained young" (Kilosa, Tanganyika Territory, 13.xi.1929).

Mr. B. B. Osmaston also referred to the probably analogous examples of the African Ant-thrushes which build in Termite-mounds. Similar associations were also known to exist in Australia.

Passing to the Oriental Region Mr. Osmaston had kindly directed his attention to the following associations between races of the Rufous Woodpeckers and the *Cremastogaster* ants, as described in Stuart Baker's "Fauna Brit. India, Birds," Vol. IV (2nd Ed.), 1927:—

Micropterus brachyurus williamsoni, Kloss, The Siam Rufous Woodpecker (pp. 62, 63).—"The nest hole is always made in an ants' nest. This latter is a curious round affair looking like a black cellular papier-maché football and is built on, or round about branches of trees, generally at a considerable elevation from the ground. As a rule it is well over twenty feet up and often over forty. The substance of these nests is very tough and stands an immense amount of rough usage, although in weight they are very light. The Woodpeckers cut an entrance in the middle of one side, work in for a few inches and then hollow a chamber out for the eggs. The ants' nest selected is often, I think almost invariably, a live nest, holding ants, pupae and eggs, and on these the birds feed freely both whilst cutting out the nest and when incubating, as long as there are any to feed on."

Micropterus brachyurus phaiceps, Blyth, The Northern Rufous Woodpecker (pp. 63, 64).—"Most birds selected ants' nests which were very conspicuous from a long distance away. . . . On one occasion putting in my hand to catch the bird which sat tight on his nest, I got severely bitten by the ants, but the Woodpeckers seem quite indifferent to their running about over them except in so far as they serve for light refreshment. . . ."

"The Rufous Woodpeckers frequent trees and bamboos and hunt for their diet, almost exclusively ants upon these, but we have also seen them on the ground feeding upon termites and ants. . . . All the birds of this genus have a very strong pungent smell of formic acid which persists for a long time even in the skins."

Micropterus brachyurus gularis, Jerdon, The Southern Rufous Woodpecker (pp. 65, 66).—"Davidson remarks on the breeding of this bird: 'all were in the centre of a nest of *Cremastogaster* ants . . . and the ants' nest chosen is generally between fifteen and twenty feet from the ground. The ants certainly do not desert the nest when occupied, and I have been terribly punished when putting my hand into a nest even when it has contained small young of this bird.' "

It might be inferred, from this brief account, that associations similar to those of the Neotropical Region were also prevalent in the two great Zoological Regions of the Old World.—E.B.P.

EXPERIMENTS WITH INSECT-FOOD ON THE AFRICAN LEMUR *PERODICTICUS POTTO*, LESSON., BY CAPT. C. R. S. PITMAN.—Prof. POULTON communicated the following interesting results sent to him, 1 August, 1929, from Entebbe, by Capt. Pitman, who wrote in the accompanying letter that he hoped to present the lemurs to the Zoological Society, on his return to England in June next year.

The acceptance of so many examples of various groups appears to indicate that the Potto is very insectivorous and that when kept in confinement with a necessarily limited insect diet it would only reject the most nauseous or terrifying species.

I. VEGETABLE FOOD.—The lemurs ate banana, Passion fruit or Grenadilla, Pawpaw, dried dates and dried prunes. They rejected Mango and Ground nuts.

II. ANIMAL FOOD OTHER THAN INSECTS.—They ate the House Gecko (*Hemidactylus brooki*, Gray), skink, and raw liver; also a fresh egg of *Colius striatus ugandensis*, Van Som., which was seized eagerly by the male and recognised as edible, but he apparently did not know how to open it. When one end was cracked, the contents were sucked greedily. Milk was rejected. Large black millipedes (up to 6 in. in length) and small forest millipedes were accepted.

III. INSECT FOOD.—(a) *Various Orders.*—Dragonflies; all Diptera offered, viz.

House-flies, Blue-bottles, and Blow-flies; most types of Coleoptera offered, including a yellow and black Cetoniid, and the Bacon beetle (*Dermestes*). *Rejected*—A large Dung-beetle.

(b) *Hemiptera.*—The only species tested was the "Cotton-stainer,"* offered on one occasion to the male Potto. This is an insect with which it is very unlikely to come in contact during its nocturnal wanderings. To my surprise it seized it eagerly and put it straight into its mouth. One bite, however, was enough for it, and making a grimace it pushed its hand into the back of its throat and swept out the offending morsel. The poor little creature then frothed at the mouth with streaming eyes and nose, reminding me rather of a person who has taken an over-dose of mustard.

(c) *Orthoptera.*—(1) *Acrididae.*—Locusts and, with one exception, all varieties of grasshoppers offered were devoured, including one of the large vivid green species with flame-coloured under wings and a disgusting smell. The soft abdomen was, however, rejected. The Acridian altogether refused was a large, earth-coloured, wingless grasshopper, with a reddish colour beneath the rudimentary upper wings. It is two inches in length and often found on flower-beds.†

(2) *Tettigoniidae.*—The "Ensenene" (*Homocoryphus vicinus*, Walk.) was accepted.

(3) *Gryllidae.*—All varieties of crickets offered were devoured, including the "Mole-cricket" (*Gryllotalpa*).

(d) *Lepidoptera.*—Only moths and their larvae were employed. Of the moths all SPHINGIDAE, NOCTUIDAE, and GEOMETRIDAE, offered, were accepted. A conspicuous day-flying Hypsid, *Deilemera* sp., was given to the female, which did not seem to care about it. It was seized quickly and eaten with relish by the male.

Of the larvae, all small smooth caterpillars and all of the "cut-worm" type ‡ offered were eaten, but the lemurs were terrified by a huge Sphingid larva which was proved by breeding the moth to be the "Oleander Hawk" (*Choerocampa nerii*, L.). This caterpillar was really a terrifying creature in aspect. It was about to pupate, was a rich rufous brown colour, with startling black thoracic "eyes" ringed with whitish, and perhaps nearly six inches in length when in motion. The male Potto which has always been the more friendly of the pair, looked at it once and then disappeared with remarkable speed for so inactive a species. The female, crouched in her corner, let the larva crawl almost under her nose before taking any lively interest. After a little while she began to crawl slowly away.—C.R.S.P.

[This last experiment provides interesting confirmation of the results obtained by Dr. G. A. K. Marshall with the larva of *Choerocampa osiris*, Dalm., and baboons, as well as those obtained with *Ch. elpenor*, L. (*Trans. Ent. Soc. Lond.*, 1902, pp. 397–401, and the references there given).—E.B.P.]

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* Mr. W. E. China considers that the species is probably one of several species of *Dysdercus* (PYRRHOCORIDAE) known as "Cotton-stainers" in Uganda.—E.B.P.

† Mr. B. Uvarov suggests that this grasshopper may be a species of *Petasia*, and agrees that the former, "with flame-coloured under wings," is certainly a *Phymateus*.—E.B.P.

‡ Mr. W. H. T. Tams agrees that the term "cut-worm" is always applied to Noctuid larvae.

Papers.

The following papers were read :—

1. " Butterfly Migration in British Guiana," II, by Mr. L. D. Cleare, Jun.
2. " On an apparently new sense organ in Lepidoptera," by Dr. H. Eltringham.
3. " The Geometridae of the St. George Expedition," by Mr. L. B. Prout.
4. " A Contribution to the Ethology of the Meliponinae," by Dr. G. Salt.
5. " Descriptions of new African Rhopalocera," by Prof. Poulton and others.

Wednesday, October 16th, 1929.

Dr. K. Jordan, President, in the Chair.

Obituary.

The President announced the deaths of the Rev. Alfred Fuller, and of Mr. H. C. Robinson, Fellows of the Society.

Exhibits.

Rare Coleoptera from Windsor Forest.—Mr. H. Donisthorpe exhibited *Rhizophagus oblongocollis*, Blatch, *R. politus*, Hell., and *Laemophloeus duplicatus*, Walt., taken under bark of oak logs in Windsor Forest on 4th June last, together with the following other beetles :—*Placusa pumilio*, Gr., *Plegaderus dissectus*, Er., *Pediacus dermestoides*, F., *Laemophloeus ferrugineus*, Steph., *Rhizophagus perforatus*, Er., *R. parallelocollis*, Gyll., *R. ferrugineus*, Pk., and *Priobium eichoffi*, Seidl.

He pointed out that *Laemophloeus duplicatus* was taken by the late Mr. Blatch at Windsor in September 1887; *Rhizophagus politus*, a new record for Windsor, was very local, and *R. oblongocollis* had not been found again till now since Blatch took it in Sherwood Forest and described it nearly forty years ago.

He also exhibited *Jeredus nitidus*, Shuck., *Euplectus nubigena*, Reitt., and *Cryptocephalus querceti*, Suffr., confined in this country to Windsor and Sherwood Forests, and *Elater coccinatus*, Rye, and *Synchita juglandio*, F., almost confined to those two localities, to show the similarity in the faunas of these ancient forest lands.

Rare moths from Spain.—Brigadier-General B. H. Cooke exhibited specimens of some of the rarer species of Heterocera taken by him this year at Albarracin, Aragon. These included the following :—

Hyphoraia dejeanii, Godt., taken in the Sierra Alta at 5000 ft. alt. This species is rarely found, and only in Spain.

Agrotis turatii, Stdf., a species till recently only known to occur at Digne.

Cucullia bubaceki, Kitt., a species first named from a specimen taken by Herr Otto Bubacek at Albarracin in 1924. There are two specimens in the Madrid Museum taken near Madrid which had been labelled *C. argentina*, but have now been ascertained to be *bubaceki*. Except for these two specimens it has not been reported as occurring anywhere other than in Albarracin. The food-plant is *Artemisia herba-alba*.

Oxycesta serratae Zerny, a newly determined species hitherto taken only at Albarracin.

Emmelia viridisquama, Gn., a little-known species, which has also been taken near Madrid and in the Eastern Pyrenees.

Axia margarita, Hb., subsp. *soledad*, Schaw., a special race of this beautiful moth, occurring only at Alberracin.

Phaselia deliciosiaria, Ld., subsp. *algiricaria*, Obth. This form was first described from an Algerian specimen, and was first taken at Albarracin by Chapman. The nomotypical form is found in Palestine.

Boarmia tenietaria, Stgr. This moth was first taken at Albarracin two or three years ago, and was a new species for Europe. The Albarracin form is similar to that found in Algeria.

Among interesting Microlepidoptera taken this year at Albarracin was *Asarta zapateri*, Rag., of which the exhibitor has presented a series to the British Museum, in which there were hitherto no specimens. This insect was discovered many years ago by Zapater and described by Ragonot from a specimen marked " Albarracin." Three ♂ specimens existed in the Seebold collection, which is now in the Madrid Museum. Since these early captures, the species had been lost sight of, and it was re-discovered two years ago by Herr Karl Predota of Vienna in the Sierra Alta, and not at Albarracin itself.

THE RARE NYMPHALINE BUTTERFLY *CHARAXES EUDOXUS EUDOXUS*, DRURY, FROM SIERRA LEONE.—Prof. POULTON exhibited a male and female of this rare and beautiful species, taken in 1910 by the late Lt. C. A. Foster at Regent, about 3 miles S.E. of Freetown, S.L., and presented to the Hope Collection by the father of the captor. No female of this race was known to exist in any museum in 1900, when the great monograph on *Charaxes* was published (*Nov. Zool. Tring.*, **7** : 281), and he had not heard of the capture, since that date, of any female except the one exhibited to the meeting.

THE NYMPHALINE BUTTERFLY *ARGYNNIS MAIA*, CRAM. (*PANDORA*, W. V.), TAKEN ON A SHIP OFF ALGIERS.—Prof. POULTON exhibited a fine female of this species believed by Major P. P. Graves to be of the Algerian race. It was taken by Mr. H. Savill during the first week in May, 1929, flying on a windless day 3–4 miles from Algiers, on a ship from Palermo. Although the distance from land was not great, the record indicated the wandering nature of this fritillary and helped us to understand its presence in the limited butterfly fauna of the Canaries.

THE COURTSHIP OF THE AFRICAN DANAINE BUTTERFLY *AMAURIS DAMOCLES*, BEAUV., f. *PSYTTALEA*, PLOTZ, AGAIN OBSERVED BY DR. G. D. H. CARPENTER.—Prof. POULTON said that he had just received from his friend Dr. Carpenter the letter containing the extract quoted below. By a curious coincidence he had only last Saturday called attention * to the fact that butterfly courtship of this kind had only been twice recorded, on each occasion by the same keen observer who has now again witnessed it.

* *Nature*, Vol. CXXIV, 12 Oct. 1929, pp. 577, 578.

"14 *September*, 1929. *Entebbe.*

"I have just returned from a three weeks' comprehensive tour of Sese. On the way back to Entebbe on Sept. 4th, in a motor boat, we met, at least 5 miles from the mainland coast and twice that from the nearest isle, a young *Python*, some 8 feet or so long, swimming on the surface. As it was early morning there was a strong off-shore breeze which *may* have helped him away from the coast. His pattern looked beautiful in the water.

"On Aug. 19th on Bukassa isle I saw the same *courtship* of *A. psyttalea* as I have already recorded (*Proc. Ent. Soc. Lond.*, 1914, p. cxi), except that I could not see the brushes actually being protruded. There were several of the species excitedly flying about and around a female, and she settled among some thickish bush, sitting on a twig with her wings depressed and held slightly backwards. The male danced up and down a few inches over her just as before."

FURTHER OBSERVATIONS OF THE ATTACKS OF BIRDS UPON INSECTS IN KENYA COLONY.—Prof. POULTON said that in the same letter of 14 Sept. 1929 from Dr. Carpenter the following recently published records were quoted :—

"A small publication has been started in Kenya called *The Bateleur* dealing with bird observations, etc. The following are extracts from No. 3, Vol. 1, July 1929 :—

"*Whydah Finches feeding on Bees and Termites.*—Reference is made to my note on the behaviour of a Whydah Finch, about which some doubt was expressed (*Proc. Ent. Soc. Lond.*, III, 1928, pp. 74, 75). Mr. C. W. Jeffery writes—'During the breeding season many seed-eating birds eat insects, and Capt. Stoneham tells me he has seen the Red-hooded Whydah (*Penthetria laticauda*) on his farm in Trans-Nzoia, Kenya Colony, taking bees issuing from an old tree-stump. On 14th May, 1929, I observed two males of *P. laticauda* catching termites. They sat on a bush from which every few minutes either one or the other would dart straight up into the air and seize a flying termite, afterwards returning to the same bush, much after the manner of a flycatcher. The crops of the birds were full of these insects.' The behaviour was thus similar to that witnessed by me and the attack by these birds on bees also confirmed.

"*Pied Wagtail eating Butterfly.*—'On 19th January, 1929, I observed an African Pied Wagtail (*Motacilla aguimp*) seize a specimen of *Junonia oenone* f. *cebrene* and devour it. The butterfly in question is an exceedingly common species, and I have never seen one taken before.'—H. F. Stoneham."

THE LARVA OF *CHOEROCAMPA ELPENOR*, L., CARRIED OFF BY A FIELD-MOUSE.—Prof. POULTON said that he had received the following interesting note from Mr. G. Fox Wilson of the Department of Entomology, Roy. Hort. Soc. Laboratory, Wisley, Surrey :—

"During the afternoon (3.20 p.m., summer time) of the 29th August 1929, I happened to be passing by the Bog Garden, which is situated at the lower end of the Rock Garden at Wisley, and observed a Long-tailed Field-mouse, *Mus sylvaticus*, carry away two fully grown larvae of *C. elpenor*, which were feeding on a species of *Epilobium*. The mouse made two journeys, on the second of which I threw a stone causing it to drop the larva which it was carrying in its mouth and holding it by the

8th and 9th abdominal segments. The larva was quite unharmed, and, on bringing it into the Laboratory, continued to feed for some days. Unfortunately, the nest of the mouse could not be traced, so that I am unable to state as to the number and condition of other larvae which may have been carried away. The mouse did not return for three other larvae which were feeding on the particular plant. The preference that this species of mouse showed for the larvae of the Elephant Hawk Moth is unknown to me.'

A little later Mr. Fox Wilson kindly added the details quoted below :—

" The fully grown larva was indeed a heavy load for the mouse, for it was partly dragged, head downwards, along the ground. The mouse was not seen to take the first larva off the plant. The second larva was feeding on the lower part of the plant, so that the mouse was able to reach up to it, but the shaking of the plant dislodged it, so that it fell to the ground from where the mouse took it. The remaining three larvae continued to feed on the plant until the 2nd September, when some of our students took them for their collections."

It was probable that the first or perhaps some earlier larva had been seized before it assumed the terrifying attitude and that the mouse had learnt by experience that it was harmless. Although other birds were alarmed by the appearance of *elpenor* larvae, a tame Jay immediately killed and ate one when offered by Weismann. *Lacerta viridis* when confronted by the larva only examined and finally attacked it with the greatest caution. Then, finding that nothing happened, it forthwith devoured the caterpillar (" Colours of Animals," Internat. Sci. Ser., 1890, pp. 260, 261 and references). That the skin of the larva was uninjured by the mouse may be due to the fact that it was carried with special care in order to preserve as much food as possible, perhaps to supply the needs of a family of young.

ATTACKS UPON MAN IN S. INDIA BY *PANGONIA* (*CORIZONEURA*, *NUCERIA*) *TAPROBANES*, WALK., AND UPON A HORSE IN N. INDIA BY *P.* (*C. N.*) *LONGIROSTRIS*, HARDWICKE.—Prof. POULTON said that he had received the following interesting comments on the communications recorded in *Proc. Ent. Soc. Lond.*, IV, 1929, pp. 23–25. Prof. T. Bainbrigge Fletcher, referring to p. 24, wrote 11 September, 1929, from camp at Kodaikanal :—

" My notes were made on *Corizoneura taprobanes*, the South Indian species, which I observed at Yercaud, where it attacked the bare legs of some coolies. I got them to stand still while the fly bit, and saw the whole process. It is impossible for the fly to feed on the wing, as the biting jaws, with which it cuts through the skin, are comparatively short. It looks formidable on the wing with its outstretched proboscis, but, when it means business, it settles on the skin, searches for a suitable place with the labella at the tip of the proboscis, which is then bent aside to allow the mandibles to pierce the skin.

" *Corizoneura longirostris* is the North Indian species. It occurs at Muktesar (Kumaon : 7000 feet ; near Naini Tal) and also at Shillong, where I have only once taken it. I have never had an opportunity of seeing the female feeding."

Mr. E. A. Andrews wrote, 18 September 1929, from the Tocklai Experimental Station of the Indian Tea Association, Cinnamara, Assam :—

" I was interested, yesterday evening, to read in the *Proceedings of the Entomological Society* for March 20th [**4**, p. 23], the discussion on the feeding habits of *Pangonia longirostris.* Some time ago I was touring in the North Lakhimpur district of Assam, close to the foothills of the Himalayas. As I was riding slowly along a rough path the horse suddenly became restive, and tried to break away. For some seconds I did not realise the cause, but eventually noticed a specimen of *P. longirostris* hovering beside the horse's shoulder. I flicked at it with my hand, but it took little notice of this, returning again and again to the attack with a series of quick darts. Eventually I took off my topee to the job, but on account of the quickness of the insect on the one hand, and the plunging of the horse on the other, my efforts were ineffective, and the insect pierced the animal three times, certainly without settling, and drawing blood each time. I then gave it up and let the horse go, and the fly did not follow us more than a hundred yards, if that. The path traversed a clearing in timber jungle, the cleared area being covered with scrub. The insect made only for the horse's shoulder. This may not be its regular habit, but it was the fact on this occasion. It made no attempt to attack me. I remember the noise it made as more of a ' frip ' than ' buzz '—not unlike the noise big dragonflies make. The noise was distinct, but I would not have called it pronounced, though of course the noise we made in dancing about was considerable.

" Whether it was the first prick that set the horse off, or the sound of the insect, I could not be certain, but the horse gave every sign of knowing exactly what he was in for, and of not liking it. Moreover, he settled down soon after the insect left us, and we met no more. The horse was a stranger to me, sent to carry me the last portion of the journey, so how often he had experienced the attack I do not know. My host was unfortunately one to whom all insects are ' bugs,' and, beyond stating that both he and his horses were often worried by ' bugs ' of all kinds, could only ' suppose that they all have pretty useful " beaks." ' The time of day, I think, was early afternoon, but I cannot be quite certain, I remember that it was bright and sunny, and exceedingly hot, and was during the rainy season."

JASSIDAE (HOMOPTERA) AS BLOOD-SUCKING INSECTS.—Prof. POULTON said that the letter quoted in the last communication also contained the following account of Mr. E. A. Andrews' experience with a Jassid insect :—

" While on the subject of feeding habits of insects, I may mention an experience I had two or three months ago which I have never had before nor since, although it happened in my own bungalow. I suddenly felt a sharp and very sudden prick on my forearm, which I took to be due to a mosquito. Without thinking, I killed it with the palm of my other hand, and then discovered that it was a small Jassid. It had evidently well settled, for it was too mangled to make much out of, but it was pale yellow-green in colour, and of the size and general appearance of *Empoasca.* It caused no irritation beyond the prick. The time was about 8 a.m."

Although the behaviour described above was unusual in the experience of most entomologists, it had been recorded on many occasions, as shown in the accompanying note kindly drawn up by Mr. W. E. China :—

" Numerous records exist of Jassids ' attacking ' man, and I have myself been ' bitten ' on the hand by *Empoasca smaragdula,* Fall., while beating birches at

Esher, Surrey. As far as is known, these incidents are merely demonstrations of irritability, although a desire for moisture may be the cause. E. Bergevin of Algiers has published (*Archives de l'Institut Pasteur d'Algérie*, Tom. III, fasc. 1, mars 1925, pp. 28—42) a paper entitled ‘ Les Hemipteres Suceurs de Sang ’ in which he records a Jassid *Athysanus vulnerans*, Bergevin, as pricking man, and discusses the question generally. About that time Dr. Marshall sent him nine specimens of JASSIDAE from Khartoum, which had been recorded by Johnston as sucking blood. These were mentioned by Bergevin but were not described until later, when Lindberg of Helsingfors published descriptions in *Bull. Soc. Hist. Nat. Afr. du Nord.*, 18, No. 4, pp. 87–94. I drew Bergevin's attention to specimens of *Athysanus indicus*, Dist., in our collection labelled ‘ caught in the act of sucking blood at Madras, in November 1919 by Lt.-Col. Donovan.’ Since Bergevin's paper, I believe Myers has published a note on this subject, but I have had no time to trace it.

“ The following species of JASSIDAE have thus been implicated :—

Athysanus vulnerans, Bergev.	S. Algeria.
Thamnotettix sanguisuga, Lindb.	Sudan.
,, *cellulosa*, Lindb.	
Euscelis curticeps, Lindb.	
Athysanus indicus, Dist.	India.
Empoasca smaragdula, Fall. (not published).	Britain.

W. E. C.”

THE CONSTRUCTION OF ITS HANGING COCOON BY A PARASITIC LARVA (HYMENOPTERA PARASITICA : ICHNEUMONIDAE, OPHIONINAE), OBSERVED BY DR. W. A. LAMBORN IN NYASALAND.—Prof. POULTON exhibited the cocoon and the male Ichneumonid which emerged and said that he had extracted the following account of the extremely interesting methods adopted by the larva, from a letter written 14 Aug. 1929, by his friend at Fort Johnston :—

“ I witnessed the other day the emergence of the grub of a parasitic Hymenopteron from its host, the larva of *Danaida chrysippus*, L., and the formation of its cocoon—an amazing process. For two or three days I had noticed the larva at rest, its abdominal surface applied along its whole length to the underside of a leaf of *Callitropis*, one of its food-plants. I then saw that the thoracic region had dropped, and that from the 4th or 5th segment on the underside was protruding the anterior extremity of a maggot-like parasitic grub. It was engaged in weaving a little noose of silk,* and when this was complete the grub pushed into it to about its middle, did some more spinning, and then gradually wriggled completely out of the skin of its host. The skin fell at once to the ground, its detachment being due, I imagine, to the removal of the weight which had until then sufficed to cause the claspers to function as a ‘ grab ’—a mechanism which ensures the continued attachment of the recently shed skin of the pupating Nymphaline larva until such time as the pupa has succeeded in attaching itself to its silken boss. The parasitic grub then passed further through the girdle so as to receive support for its hindmost

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* Evidently already attached to the underside of the leaf beside the host. The point of fixation is now, in the dried leaf, about 5·0 mm. distant from the midrib to which presumably the dead Danaine larva was still adhering.—E.B.P.

segments only, and then made further spinning movements, with its head down. It gradually slipped through the girdle, and I then discovered that it had made a cradle of a few very fine strands of silk, in which it was able to turn completely round; then, with head upwards, it spun the two limbs of what had been the girdle together into a single thread. By weaving further supporting strands below and wriggling down between those above it gradually lowered itself to about ¼ inch, and eventually thickened up the cradle to form the beautiful little cocoons which are such familiar objects to the Entomologist out here. I feel sure that some two or three years ago, I sent you many similar cocoons with much longer threads than that of the example described above. They were made by the abundant parasites of a Lymantrid larva."

THE MUTILATION OF BUMBLE-BEES AND OTHER INSECTS BY MALE BEES OF THE GENUS *ANTHIDIUM*.—Prof. POULTON exhibited a male *Bombus terrestris*, L., which had arrived only that morning (16 Oct. 1929), sent from Newton Abbot by his friend Dr. R. C. L. Perkins, F.R.S., who had written the following account of the circumstances in which it was found :—

" I am sending you a male *Bombus terrestris*, which I have no doubt had lost its right fore-wing owing to mutilation by an *Anthidium* as described in J. Davis Ward's paper I mentioned previously to you [*Entomologist*, Vol. 61, 1928, pp. 267–272].

" I saw this *Bombus* hurrying away along the ground a few yards from a lavender plant just over my garden wall, and guessed at once what had happened, as it could not rise from the ground. My son climbed over and got it, and we watched the lavender; there were several bumble-bees, drone-flies, etc., on the flowers and one huge male *Anthidium*. This male flew at every bumble-bee it saw or any other large insect, and knocked down several but did not cut the wing of any while we watched. After a while a single female *Anthidium* came along, and it pounced on this in just the same way, but held it securely and pairing was effected. No doubt its grasping structures are adapted for holding its own female, and when it cannot hold a *Bombus* or other insect I presume that in trying to do so it occasionally cuts off a wing."

Dr. Perkins' interpretation (*ibid.*, p. 273) of Mr. Ward's admirable series of observations was thus confirmed.

AN EARLY FIGURE OF *CHRYSOPHANUS DISPAR*, HAW.—Mr. EDELSTEN mentioned that since the publication of the Report of the Committee for the Protection of British Lepidoptera (*Proceedings*, Vol. IV, Pt. 1, July 1929), Dr. Drewitt had called his attention to an earlier (but unpublished) figure than that by Lewin (*Insects of Britain*, 1795) in the Icones of William Jones of Chelsea (Vol. V, Plebeii, Plate LVI, 1785). The figures show a ♂ upper and underside, and a ♀ from Drury's collection. The specimens are named *hippothoe*, but are undoubtedly *dispar*. Bound in with this volume is the MS. list of names of many of the figured specimens, stated in a note by William Jones to be in the handwriting of Fabricius, who named and described over 200 species from drawings in the Icones. The six volumes of Jones' Icones, together with his butterflies, were presented in 1925 to the Hope Department in the Oxford University Museum by Dr. Drewitt.

Prof. Poulton brought Vol. V for exhibition, also a ♂ specimen of *C. dispar* from Jones' collection.

Dr. Drewitt, who was present as a visitor, also exhibited from the same collection a ♀ specimen, which he has now presented to the Hope Collection. These specimens of *dispar* must be among the very earliest known to be taken in Britain. Dr. Drewitt also exhibited a specimen of *Chariclea delphinii* which was taken by Jones in Chelsea.

Wednesday, November 6th, 1929.

Mr. J. E. Collin, Vice-President, in the Chair.

Election of Fellows.

The following were elected Fellows of the Society:—Miss L. I. Clarkson, Apipucos, Recife (Pernambuco) Brazil; Mr. W. Cook, 84, Walnut Tree Avenue, Cambridge; Miss W. P. K. Hughes, 83, Bay Road, Sandringham, Victoria, Australia; Mr. A. Pickles, B.Sc., 16, Cambridge Street, Clayton, Bradford; Rev. R. Simpson, M.Sc., Cranleigh Road, Surrey.

Amendment of Bye-Laws.

The proposed amendment of the Bye-Laws.—Chapter XII, Library Regulations, to be considered at a Special Meeting in December, was read for the first time.

Exhibits.

Lepidoptera from Alaska.—Mr. L. W. Newman exhibited on behalf of Mr. A. N. C. Treadgold a collection of Lepidoptera, all captured at Klondyke in June 1928, and said that some of the species represented greatly resembled British ones. The collection had been presented to the British Museum (Natural History).

An imported Noctuid larva.—Mr. Newman also exhibited a living Noctuid larva accidentally imported in a case of Chinchicheree (*Ornithogalum thyrsoides*) from South Africa.

Biological note on the South African beetle *Urodon lilii*, Fåhraeus.—Dr. Hugh Scott exhibited specimens of this beetle and seed-vessels of *Watsonia* sp., from which they were bred. Spikes of these seed-vessels were collected at Witzieshoek, about 30 miles from Harrismith, O.F.S., at an altitude of over 6000 feet, 22–23.ii.1929. The object was to get seed for botanical gardens, but several of the beetles, together with a larva or pupa, were discovered alive inside the seed-vessels on 31.iii.1929, a week after Dr. Scott's return to England.

This is apparently the first record of the food-plant of any South African species of *Urodon*. *Watsonia* belongs to the Iridaceae, and to the same section of that Order as *Gladiolus*. The Watsonias are among the showiest of South African wild flowers. The plants from which these seed-vessels were collected had quite finished flowering, so the species cannot yet be named, though the genus has been determined by Dr. A. B. Rendle, F.R.S. Seeds have been sent to the Botanical

Gardens at Kirstenbosch, Kew and Cambridge, so that it is hoped that the plant may be grown and precisely identified.

Urodon is a genus of uncertain systematic position. Examples of *Urodon lilii* were swept from grass at Witzieshoek, and when in the net they have rather the facies of bark-beetles (SCOLYTIDAE). The genus was described by Fåhraeus in Schönherr's *Genera et Species Curculionidum*, vol. v, 1839, and was included in CURCULIONIDAE as then understood. It has since been placed in BRUCHIDAE, but subsequently removed to ANTHRIBIDAE, though Dr. Jordan has given reasons (*Proc. Ent. Soc.*, 1924, p. xcviii) for regarding it as a Bruchid. However, in the Catalogue of ANTHRIBIDAE published this year (*Coleopt. Cat.*, Pars 102, 1929), P. Wolfrum places the genus in a special subfamily, URODONINAE.

In Wolfrum's Catalogue 45 species of *Urodon* altogether are listed, from various parts of the Palaearctic Region, West and South Africa, and Ceylon. It is biologically interesting that the Palaearctic species, so far as known, are associated entirely with Cruciferae and the allied Order Resedaceae. The larvae of *Urodon rufipes*, Ol., and *U. conformis*, Suffr., live in the seed-capsules of *Reseda lutea* and *R. luteola*, eating out the contents of the seeds, and pupate in the soil.* Commander J. J. Walker has found that certain Mediterranean species are, in the adult stage, essentially flower-beetles, haunting the flowers of common Cruciferae; and in a very recent paper † Peyerimhoff has described two new species from the Hoggar [Ahaggar] Massif in the French Sahara, nearly on the Tropic of Cancer, one of which is always found in the flowers of *Reseda lutea*, while the other is exclusively attached to the flowers of a desert Crucifer, *Schouwia purpurea*. It is remarkable that the South African *Urodon lilii* has a food-plant of the Order Iridaceae, so very far removed from the Cruciferae and Resedaceae. Peyerimhoff mentions a group of species within the genus *Urodon*, characterised by special morphological features and all attached to Resedaceae, and it may be that the genus comprises several sections, attached respectively to Cruciferae, Resedaceae and certain Monocotyledonous plants.

Urodon lilii evidently has a wide distribution in South Africa. In the British Museum there are examples from Table Mountain, while those now exhibited were taken hundreds of miles away in quite a different province and climate. There is no indication why the name "*lilii*" was given to this species. The genus *Lilium*, as now understood, does not occur in South Africa, but probably the name referred to the association of the adult beetles with various lily-like flowers.

ACCIDENTAL TRANSPORT OF SOUTH AFRICAN INSECTS OVERSEAS BY HUMAN AGENCY.—Dr. H. SCOTT also exhibited insects of four species found by him on board ship on his homeward voyage from South Africa in March 1929, or among his personal belongings after his return. They were as follows :—

(i) The specimens of *Urodon lilii* discussed in the preceding exhibit.

(ii) An example of the Bostrychid beetle *Heterobostrychus brunneus*, Murray, found nearly five months after return to England, damaging a tray of native

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* See Frauenfeld, *Verh. z.-b. Ges. Wien*, 18, p. 160, 1868; Kaltenbach, *Pflanzenfeinde*, p. 42, 1874; Buddeberg, *Jahrb. Nassau. Ver. Naturk.* (Wiesbaden), 36, pp. 141–144, Pl. II, figs. 13–17, 1883.

† *Bull. Soc. ent. France*, 1929, pp. 145, 146.

THE ENTOMOLOGICAL SOCIETY OF LONDON

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MEETINGS

TO BE HELD IN THE SOCIETY'S ROOMS

41, Queen's Gate, S.W. 7

1930.

Wednesday,	January (Annual Meeting)	15
,,	February	5
,,	March	5
,,	March	19
,,	April	2

The Chair will be taken at Eight o'clock.

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